

The usual measures used to document use of medical services were found insufficiently penetrating in a utilization study conducted by the authors. A useful measure which gives meaning and coherence to the units of service conventionally reported, e.g., numbers of physician visits and days of inpatient care, was found in the unifying concept of episodes of medical care.

DELINEATING EPISODES OF MEDICAL CARE

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Introduction

The Problem

THE kinds of data which report the use of medical services generally fall far short of representing the complex reality of medical care. More revealing measures of utilization are needed to reflect the actual course and content of the medical care received by individuals and populations.¹

The summary statistical data used to describe the medical care received by a population usually take the form of (1) stating how many in the population have obtained medical services in a given period of time (the volume of users), and/or (2) expressing the volume of services in terms of the number of physician visits made, the days of inpatient care provided, the number of x-rays, lab tests, medications, physical therapy treatments, and so on.

These cumulations are valuable in so far as they represent, in an over-all way, the sheer volume of service. But their very simplicity, their objectivity, and apparent precision are deceptively reassuring. They create the illusion that the essential facts of utilization are thus expressed. There is much more to

tell of medical care than these superficial counts reveal. And it is important to be able to tell it.

The need to design measures and methods to reflect utilization effectively is intensified as medical care itself grows more complex. Yet our data on utilization remain couched in such elementary terms as counts of visits and days. No matter how precise these traditional measures of service volume, they are by their nature incapable of adequately representing the changing scope and character of medical care.

The deficiency of the conventional measures in merely tallying a procession of units of service is that they are not addressed to the heart of the matter—to represent the “natural history” of medical care. A keen observer has aptly stated that “. . . it is the glory of science to become ever more and more precise in its measurements, and it is the agony of the scientist to discover that when his measurements are really precise, what he has measured is just to one side of what he is after.”²

New Approach

This paper suggests and demonstrates a way of perceiving utilization which

captures the natural history of medical care. The approach proposed is to express services in terms of *episodes of care* rather than as *isolated units of service*.

In a literal sense care is, to be sure, rendered in the form of units of service. Nevertheless, the discrete service is in practice related to a need and purpose, to which other services may likewise be related. This interrelatedness becomes apparent when the service is viewed in the context of the whole episode of care in which it occurs. The function of the individual item of service emerges precisely because it is placed in the framework of an episode of care addressed to a particular problem or objective.

The perspective which employs episodes may be appreciated through contrasting two cases from a study by the authors. In this study, which deals with the medical care received by nursing students during their three years in a hospital school, two girls display virtually identical over-all utilization of medical service. They had made approximately the same number of ambulatory visits and had the same number of inpatient days of care. All told, Miss A cumulated 84 visits and Miss B, 86 visits; each had three days of inpatient care.

Though these utilization profiles appear to be quite alike, they take on a different aspect when the dimension of episodes of care is superimposed. Miss B emerges with twice as many episodes as Miss A—27 as against 15 (Table 1). Their experience is predictably similar with regard to the standard diagnostic and preventive services prescribed by the school. Beyond that, however, it becomes apparent that whereas Miss B had numerous brief encounters, Miss A's history of service was rather dominated by a single episode (a back injury) which consisted of 25 visits.

Clustering the discrete items of serv-

ice into episodes portrays medical care for what it really is, or properly should be—a problem-solving sequence related to a specified objective. The range of illustrations which follows will convey the general sense of the concept and, at the same time, will reveal the diversity of forms in which episodes of care can occur.

Spectrum of Medical Care Episodes

These specific examples of what constitutes an episode of medical care will, it is hoped, make more meaningful the discussion of the subsequent sections dealing with definition, principles, and criteria for application.

1. A physician is contacted by a person with a foreign body in his eye. In

Table 1—Episodes of medical care, by diagnostic category: comparison of two nursing students

Diagnostic category	Episodes		Visits	
	Miss A	Miss B	Miss A	Miss B
Total, 3 years	15	27	84	86
Standard diagnostic and preventive services,* total	6	7	51	56
Annual routine diagnostic program	3	3	15	15
Monthly weight-taking	1	1	30	32
TB immunization	1	1	5	5
Culture for staphylococcus	1	2	1	4
Other services, total	9	20	33	30
Accident-injury	1	1	25	2
Allergy		1		2
Gastrointestinal	3	1	3	1
Genitourinary	1		1	
Immunization	1		1	
Respiratory	1	7	1	11
Sense organs		2		3
Skin		6		9
Ill-defined	2	2	2	2

* Routinely performed for all students, under school regulations.

a single medical contact the physician evaluates the situation, removes the foreign body, judges that there is no likelihood that complications will ensue, and indicates that no follow-up care is required. The episode is closed in a single visit.

2. A young woman is seen in the office of her family physician with a fever and symptoms of upper respiratory infection. The doctor prescribes medication and rest and requests that she return in two days. Upon that visit her temperature is found normal and her symptoms have subsided. The physician suggests that she complete her course of medication and resume normal activities the following day, with no further contact necessary. Two visits have constituted this episode.

3. A patient presents herself to her internist with severe back pain. Her history is negative for injury or previous similar complaints. Physical examination reveals mild scoliosis, confirmed by x-ray, and an orthopedic consultation is obtained. The orthopedist prescribes corrective footwear and schedules weekly visits. After two months the patient is relatively free of symptoms and is discharged from surveillance, thus closing this multivisit episode. However eight months later, when the patient comes in to have her back checked, the internist refers her for reevaluation by the orthopedist, who recommends no further treatment. This second episode consisted of two visits, to the internist and orthopedist, respectively.

4. A college student, unable to attend classes because of severe abdominal pain, is diagnosed in the Health Service as having acute appendicitis and is admitted to the hospital. Following surgery and five days of hospitalization, the student is discharged to his home. Three weeks later the posthospitalization checkup by the family physician concludes the episode.

5. An emergency room physician re-

fers to the hospital's outpatient department a laboratory technician who has fainted while on duty. The cause is identified as anemia. The therapeutic program introduces nutritional supplements in the form of diet therapy and medication, with repeated laboratory evaluations and medical observation for a period of one year. The patient is then advised to discontinue medication and return to the clinic if necessary, thus terminating the lengthy episode which began with the emergency room visit. Six months later she returns to the clinic with a recurrence of symptoms, and another course of treatment for anemia is instituted, constituting another episode.

6. Episodes of medical care may be constructed not only around pathology but also around preventive care. Episodes of preventive care are illustrated by the following examples:

- a. An isolated contact for influenza vaccination.
- b. A series of closely interrelated visits to administer a course of BCG vaccine.
- c. A health evaluation series consisting of visits for physical examination, chest x-ray, and laboratory tests.

Conceptual Formulation

Basic Definition

In their duration, content, and significance, the episodes just described portray a very broad spectrum. Yet a common idea is represented within this diversity. The dictionary definition of "episode" (Webster's Third New International, 1961) begins to express this common idea as "an occurrence or connected series of occurrences and developments which may be viewed as distinctive and apart although part of a larger or more comprehensive series."

The concept of an "episode of medical care" is proposed, beginning with the following basic definition:

An episode of medical care is a block of one

or more medical services received by an individual during a period of relatively continuous contact with one or more providers of service, in relation to a particular medical problem or situation.

It should be recognized that an episode of *medical care* does not necessarily coincide with an episode of *illness*. Indeed, one may not accompany the other at all, since medical care is not introduced in every illness, and conversely, medical services may be obtained in the absence of illness. And when they do occur in combination, in cases of attended illnesses, the start and completion of an episode of care may be timed quite differently from the onset and cessation of the illness to which it is directed. Consequently, analyses employing the more conventional entity of illness episode serve a different function from analyses based on medical care episodes. When medical care itself is the focus, then: "The natural history of the patient's medical care may be a more appropriate concern than the natural history of his disease."³ These two approaches to describing medical experience are not to be regarded as *competing* alternatives, but rather as accomplishing different functions as appropriate to specific problems.

Explanatory Principles

Several basic principles elaborating on the definition are offered below to clarify the concept of medical care episode.

1. The problem or situation around which an episode of medical care is constructed may variously be a complaint, objective symptom, diagnosed disease, or a health objective in the absence of pathology.

2. Whatever its length, an episode can be construed to have the following essential features:

a. A beginning in its confrontation of a situation.

b. A course of service directed toward an objective.

c. A point of termination or suspension of service (represented either by explicit discharge or withdrawal from care, or by a lapse or suspension sufficient to constitute a distinct break of contact with medical service for a given problem).

3. An episode may be as confined as a single isolated encounter which has no tie to other encounters, or it may be a long chain of related encounters not interrupted by a substantial time lapse or a break in contact with health service personnel.

4. An episode encompasses all the services addressed to the problem or situation around which it is formed, including inpatient days of care and outpatient visits for physician, nurse, x-ray, laboratory procedure, dentist, physical therapy, pharmacy, and so on.

5. A succession of episodes may form around the same general diagnosis or problem. This may occur in the case of remissions and recurrences of the condition. Even with a persistent condition, however, it may occur because of interrupted or episodic medical attention. (Note that "episodic" when used to mean fragmented is a different usage from that of "episode" as presented here; "episode" of medical care is formulated as a *unifying* concept.)

6. Different episodes constructed around different problems may overlap one another or even run concurrently.

Implementation

This introductory paper does not presume to spell out in full the details of how the concept of medical care episodes is operationalized. Apart from limitations of space, there remains the need to develop and refine the methods still further. However, within these limitations, what follows in the balance of this paper will convey the essentials drawn from the experience of delineating episodes in one medical care study.

Specific Criteria for Delineating Episodes

The process of delineating episodes of medical care rests on the application of three distinct criteria: (1) the patient's medical situation, (2) the time intervals between services, and (3) the nature of the medical management. Although a bit will be said about each of these criteria individually, it is the interplay of their joint application, to be discussed subsequently in case illustrations, which is crucial in forming specific episodes.

1. *Patient's medical situation*: A common focus on a single medical condition or health objective, or a close relationship among multiple medical conditions, is needed to bind different encounters into an episode. A single diagnosis is the clearest case, of course. However, several diagnoses (or complaints or symptoms) can also constitute a single episode if there is an etiological or interacting relationship among them.

2. *Time interval*: Proximity in time is ordinarily required if services are to link together into an episode. A time lapse between encounters suggests the possibility of an actual interruption in medical care, with resumption of service constituting a new episode. However, there is no absolute maximum on the time interval between services which can be posed as a consistent standard for crediting the continuity represented by an episode. The time element can be evaluated only in relation to the other factors. (Correspondingly, there is no absolute time limit on the total length of an episode of care.)

3. *Medical management*: An episode evolves largely according to the character of the physician's management. If he conceives certain conditions of the patient as separate from each other, they are likely to be dealt with in the manner of separate episodes. On the other hand, if he blends his management of potentially separable conditions into a coordinated entity, he thereby molds a single episode of medical care. The pa-

tient, too, influences the formation of episodes by his choices in obtaining medical services. He may, for example, maintain a single episode of care though seeking services from a variety of sources (by virtue of the other two criteria—the condition brought to medical attention, and the time allowed to elapse between encounters). Or he may create multiple though concurrent episodes of care by bringing what he perceives as unrelated problems to different sources of care.

Illustrative Applications of the Criteria

The applicability and interplay of these criteria for delineating medical care episodes are demonstrated by the various considerations entering into the following cases:

1. The influence of time intervals between services upon the delineation of episodes may be shown in the simple instance of visits to a physician for treatment of coryza. If the visits occur on successive days, the brief time interval between services would clearly link them into a single episode of care. If, on the other hand, the visits for treatment of coryza are interrupted by an interval of several weeks, it would appear, because of the short-term, self-limiting nature of the illness, that separate coryza attacks and episodes of care are involved.

2. In contrast, longer time intervals may occur between services without creating separate episodes, depending on the nature of the disease or health objective. The patient with diabetes, for example, may be seen at monthly intervals for blood sugar evaluation, yet these visits are closely linked in the over-all control of his disease.

3. It becomes apparent that chronic or intractable diseases elicit a distinctive application of the time-interval criterion in delineating meaningful episodes of care. Not only is the diabetes care episode likely to be a prolonged one, but

much of it may be slow-paced in the sense of proceeding through widely spaced visits. An unbroken sequence may transpire until the diabetes is stabilized. At that time, the physician may end the episode of care by suspending regular visits, asking the patient to return only in the case of difficulty, or in six months for a checkup. Such resumptions of service are to be regarded as new episodes of care. With exacerbations and remissions, episodes of care will naturally vary, some being characterized by active, intensive treatment, and others by phases of surveillance.

4. Another type of patterning of episodes in chronic diseases may hinge on the relationship between the basic disease process and its sequelae or intercurrent illnesses. For example, the management of osteoporosis and of an intercurrent fracture may be linked into a common episode. This depends, however, upon the phasing and time relatedness of the respective problems and upon the way in which the medical management itself is structured. In the case where the treatment for the fracture is handled independently of the treatment regimen for the osteoporosis, it may constitute a separate episode.

5. Employing the patient's medical situation as a factor in delineating episodes in his care becomes most difficult when his condition is not specified in terms of a clear, single diagnosis. Multiple presenting problems (whether definitive diagnoses, specific or generalized complaints, symptoms, or asymptomatic needs for therapeutic or preventive care) invoke fine discriminations to determine whether they are to be sorted out into separate though concurrent or overlapping episodes, or considered a unity in terms of medical care. A particular presenting situation might yield quite different episode arrangements according to the manner in which the

physician manages the care of the patient. A case in point is a patient receiving care for a persistent head cold and a severe allergic dermatitis, which could be managed as two separate episodes treated concurrently. However, in this instance, the patient is experiencing a generalized state of excessive fatigue which leads the physician to deal with both conditions as a unified problem which he treats with bed rest. Although the underlying causative factors in themselves might ordinarily have been treated medically as concurrent but separate entities, they are thus merged into a single episode of medical care by virtue of the physician's response to the generalized complaint of excessive fatigue and his unified management of the case as a whole.

6. The necessary interplay of the several criteria in making a determination of the boundaries of an episode can be seen in the following case illustration. A senior nursing student was attended in the Health Service for leg pain suggestive of acute thrombophlebitis. She had a two-year history of venous insufficiency managed conservatively by her family physician. Treatment with elastic stockings, elevation of legs, exercise, and rest was prescribed by the Health Service physician who continued to see her daily. At the time of her fourteenth daily visit to the physician the acute phase of her illness had subsided, and she was able to resume her regular activities. Since her condition appeared to be stabilized, she was advised to return for observation at two-week intervals.

One month later the student developed signs and symptoms consistent with a pulmonary embolus. She was hospitalized and long-term anticoagulant therapy was instituted. After a ten-day hospitalization she was discharged and followed on an ambulatory basis with weekly visits to the Health Service for clinical and laboratory observation.

Seven months later anticoagulant therapy was discontinued. No further medical management was indicated at this time.

Application of the criteria for episode determination suggests that this entire phase of the student's medical history consisted of a single episode of care: an episode which had a recognizable beginning with the onset of acute symptoms presented to the Health Service and a natural ending in a cessation of active medical management eight and one-half months later. During this period she experienced more than 40 ambulatory visits at intervals of one to 14 days, and a hospitalization of ten days. Interpretation of this sequence of events and services as one episode flows out of a pro-and-con interplay of the three criteria used in delineating episodes, with the following considerations entering:

- a. As far as the diagnostic content itself is concerned, the initial acute thrombophlebitis and the subsequent pulmonary embolus are subject either to interlinking into a single episode or to being confined to separate episodes.
- b. The time intervals between services (one to 14 days) are within a range to be expected in an unbroken course of treatment and recovery for the medical condition involved.
- c. Given the amenability of the first two criteria in this situation, it is the medical management which definitively establishes the sequence of services as a single episode of care. As managed by the physician, each of the medical contacts had a recognizable therapeutic relationship to the content of the services which preceded and followed it. Conservative treatment at the onset of thrombophlebitis flowed into continuing surveillance as the acute attack showed signs of subsiding, with treatment intensified in response to the appearance of the embolus and then a long period of close observation maintained until recovery and discontinuation of services.

These case illustrations demonstrate that all three criteria of condition, time, and management must come under consideration in delineating specific epi-

sodes. The respective influences of the criteria vary relative to different case situations.

Clinical Relevance and Potential

As useful as the episode concept can be in the organization and analysis of utilization data, its utility may be even greater in its application to the actual practice of medicine. There the episode concept can serve as a framework within which the physician may plan and carry out the care of his patient. With this perspective, the physician might, on confronting a new situation presented by a patient, perceive it as the beginning of an episode. He might at the outset, then, explicitly spell out (for himself and perhaps for the patient) his specific expectations, goals, and plan of management for the foreseeable episode. While this procedure may only express what is often implicit in medical practice, its deliberate use in practice, prospectively, promises to assure and facilitate early planning of his patient's care by the physician.

The concept and its application in practice provide, moreover, opportunities for measurement of achievement in patient care. When a goal is established by the physician for an identifiable episode, it becomes possible to relate to these anticipations what is actually achieved.

A frame of reference transcending the individual case is further suggested. Medical experts might well formulate standard episodes of care for certain conditions, specifying how they would ordinarily be managed most effectively and economically. This would go somewhat beyond the cataloguing of needed services for a given condition as comprehensively demonstrated by Lee and Jones in 1933.⁴ The anticipated natural history of the medical care would be outlined in longitudinal profile to provide norms of identifiable episodes of

care. Medical practice, clinical investigation, and population studies could all relate to such norms in useful ways.

Summary

The increasing complexity of medical care calls for better ways to document and analyze the utilization of medical services. To rely on traditional statistical data, simply giving the volume of physician visits, inpatient days of care, and other conventional units of medical service, is to fall short of truly describing the character of an individual's or a population's use of medical services. Mere cumulation of these conventional counts fails to relate the units of service to their specific objectives and so fails to relate them to each other. To order and cluster these same units of service systematically into unities or nodes of medical care addressed to a medical problem or health objective is to bring the meaning and purpose of the services into clear perspective.

The concept of "medical care episodes" is proposed as a new dimension for representing medical service utilization. The medical care episode is a framework for clustering discrete units of service into cohesive entities. The delineation of episodes takes into account: (1) the patient's medical problem or situation, (2) the time intervals

between services, and (3) the nature of the medical management.

Applicable both in the direct provision of medical care and in the analysis of utilization, the concept of episodes of medical care forms an important bridge between clinical practice and patient care research.

An actual demonstration of utilization analysis using the medical care episode as a central concept has been accomplished by the authors. Data from that study of a cohort of students in a hospital school of nursing will be reported in a companion paper.⁵

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